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Views on Mini UAVs & Mini UAV Competition

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Micro Aerial Vehicle & Tactical Maritime UAV

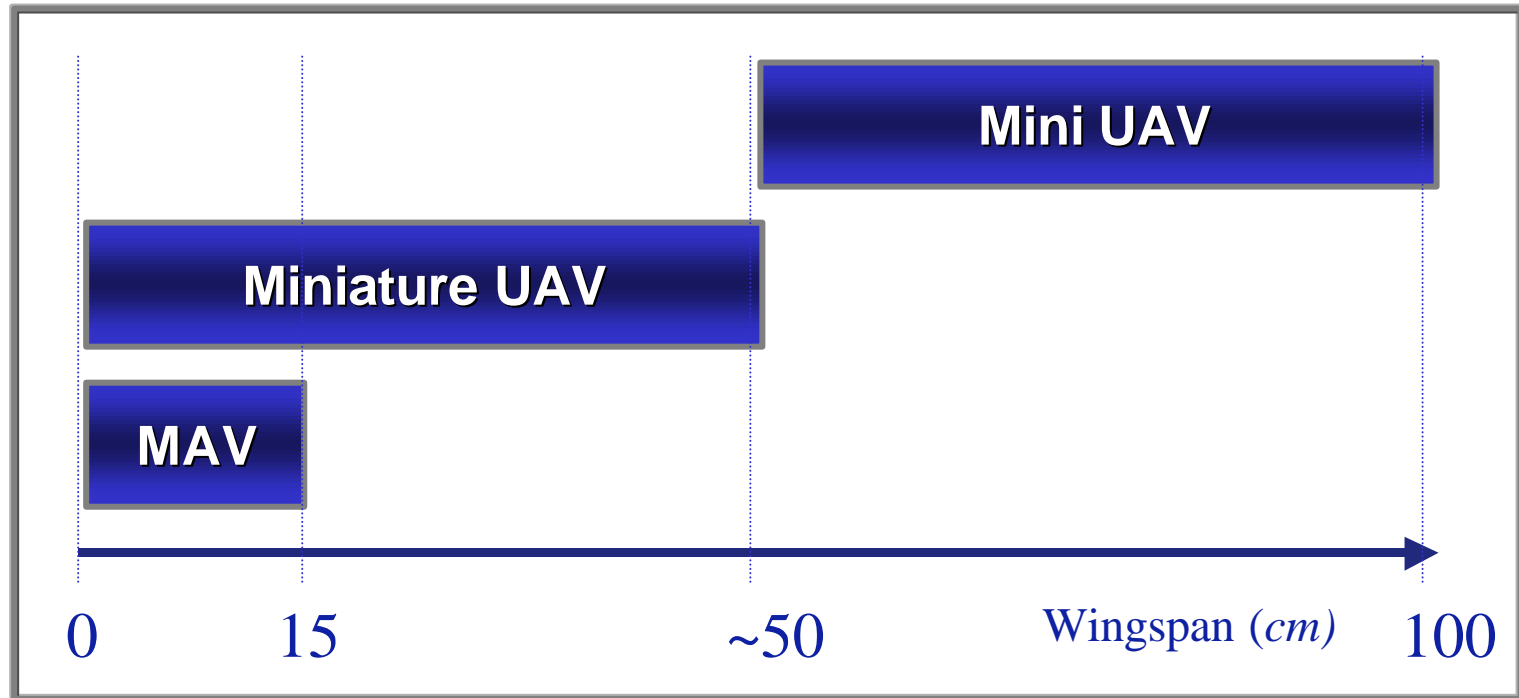
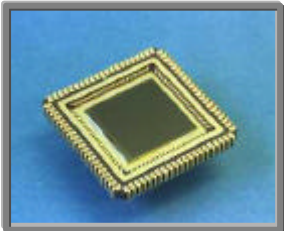
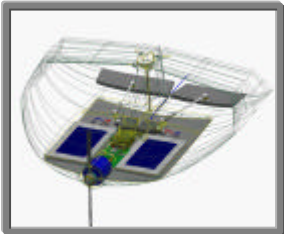
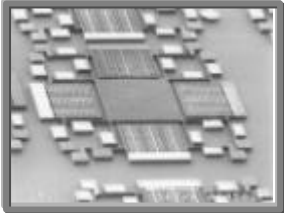
DGA/DSA/SPMT

WEAPON SYSTEMS DIRECTORATE
Tactical Missile Programs division

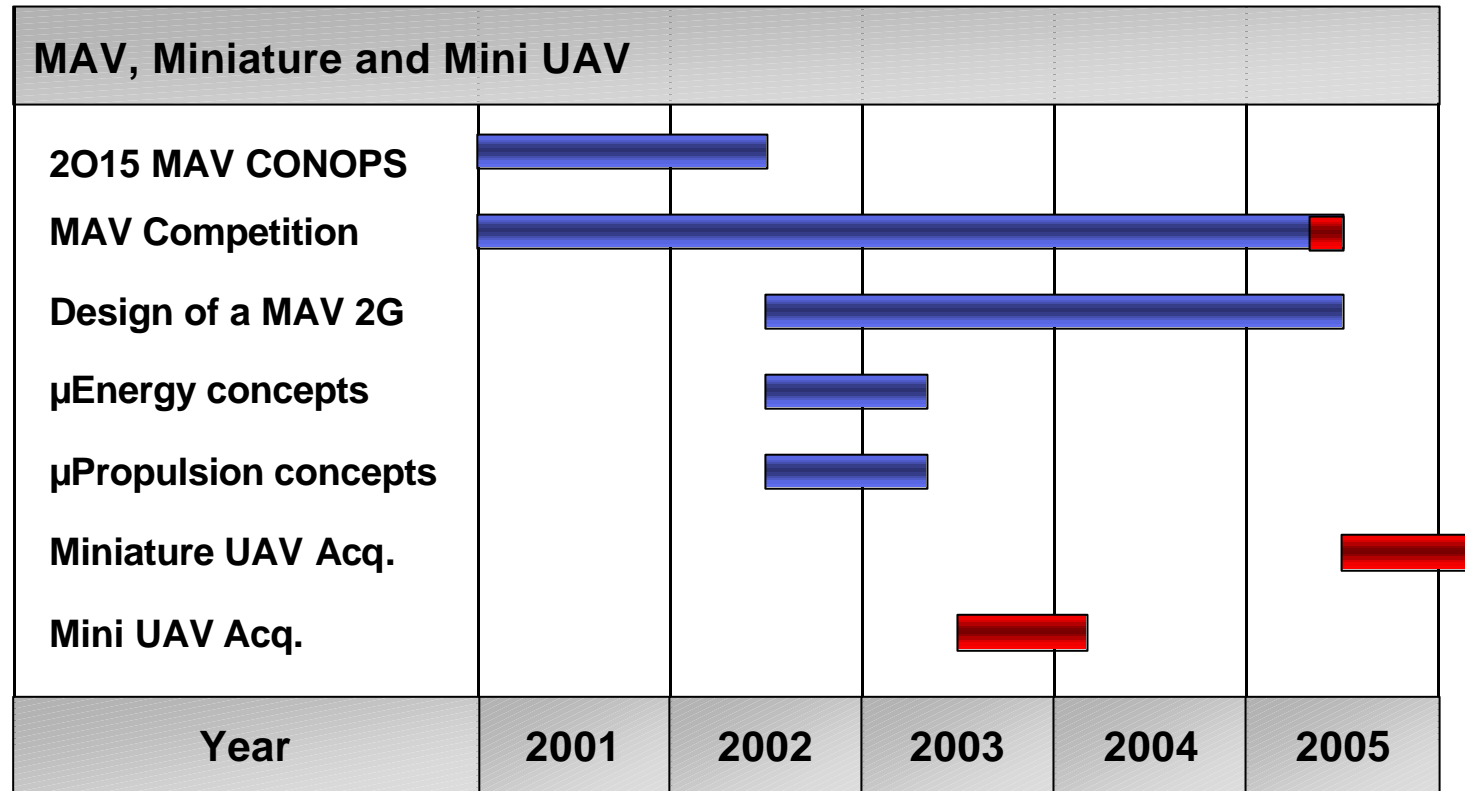
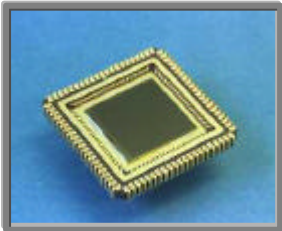
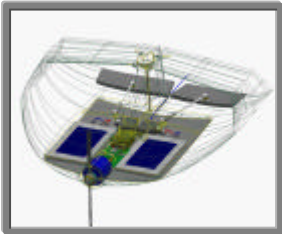
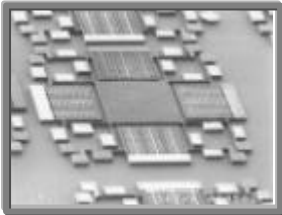


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« French Definitions »

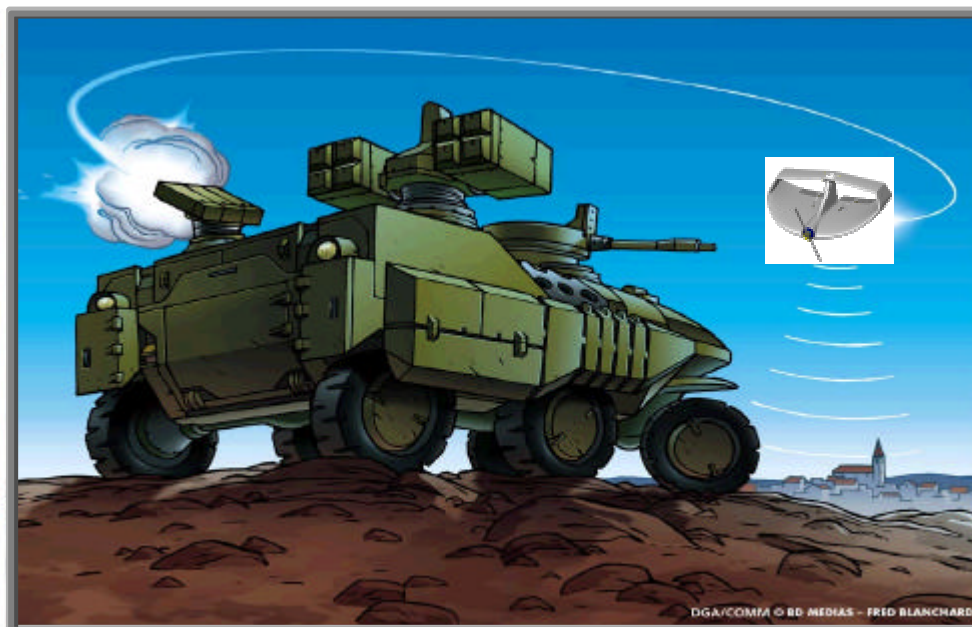
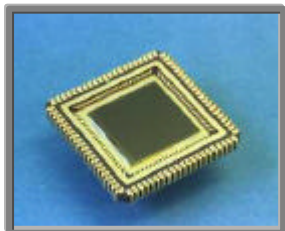
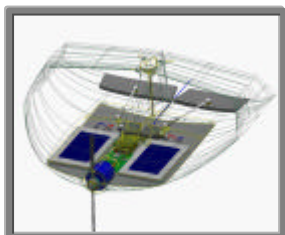
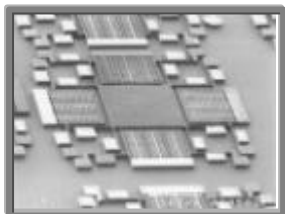


French Mini & Miniature UAV Roadmap



Operational Needs

Local Situational awareness for small units



Urban Intelligence for Army & Special Ops Corps



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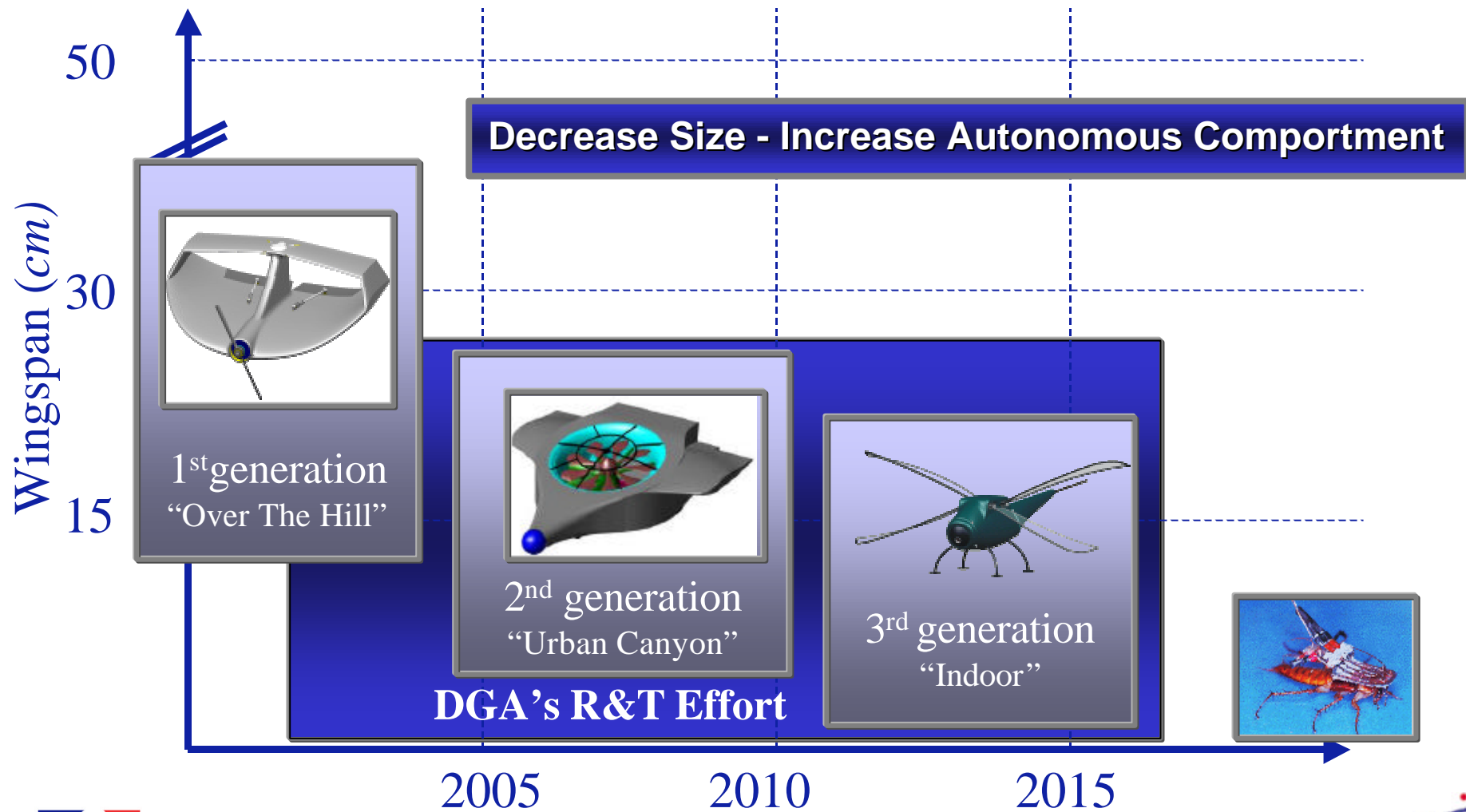
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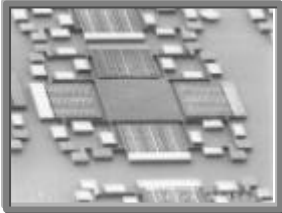
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Miniature UAV Evolution

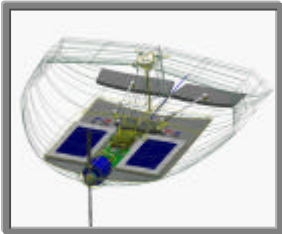


Assessment of Operational Scenarios



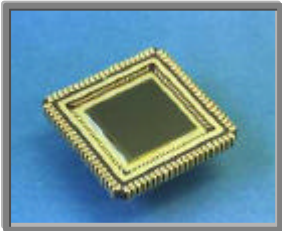
Scenario 1

Observation in Open Space



Scenario 2

Observation in Urban Area



Scenario 3

Indoor Observation



Scenario 4

Ahead of a Platoon in Dangerous Env.

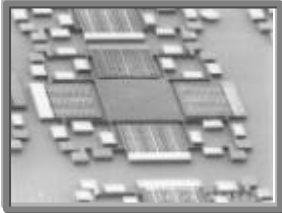
Scenario 5

Target Designation

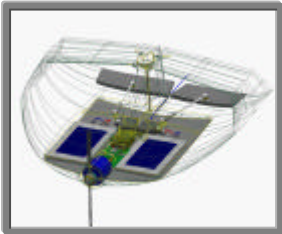
Scenario 6

Armed MAV : Attack on a Fixed Target

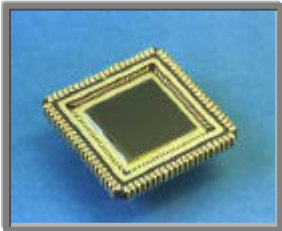
R&D efforts focus on MAV2 & MAV3



Aerodynamics of low Reynolds (<5000)



μ Energy sources & μ Propulsion concepts



MEMS for μ actuators and μ sensors (μ Cameras, μ gyros...)

Data Link



User Interfaces

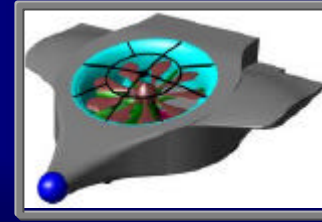
... no technological legacy from other UAV Systems

R&T efforts focus on MAV2 & MAV3

On-going Studies

Design of a 40-cm VTOL Miniature UAV

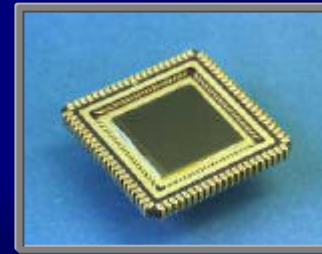
Aerodynamics of low Reynolds (<5000)



Engagement
in Urban Area

μtechnologies:

- μPropulsion
- μEnergy sources
- μactuators
- μsensors (μCameras day/IR, μgyros...)



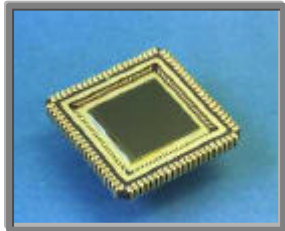
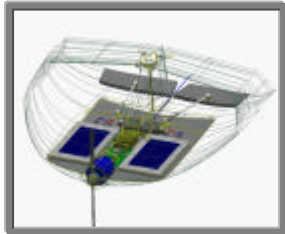
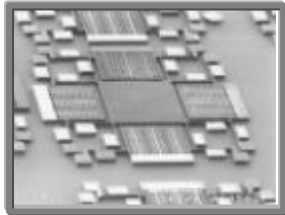
Comms dedicated to urban area

Positional calculation
User Interfaces
Autonomous Navigation



Next

Requirements and Schedule



Miniature UAV 2G Requirements

Wingspan 40 cm +/- 10 cm
Weight < 1,5 Kg
Speed range 0 - 10 m/s
Flight altitude 100 m

Control range 1000 m
Endurance 15 up to 20 mn
VTOL Capabilities
Autonomous flight control

Mini Drone

Acquisition

Miniature 1&2G

R&T

Acquisition

3-year Contract

Miniature 3G

R&T

Acquisition

2002

2005

2010

2015



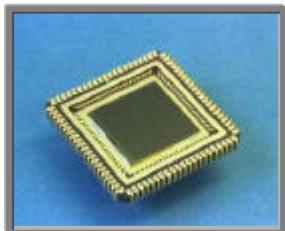
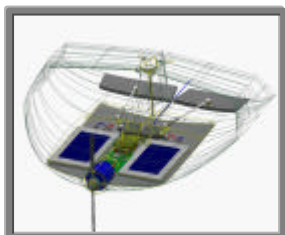
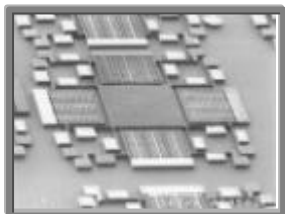
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2005 MAV International Competition



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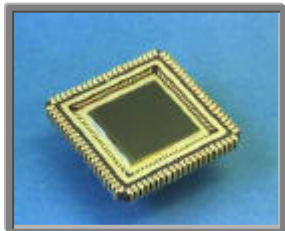
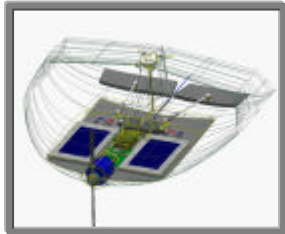
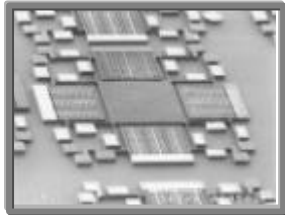
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Inter. MAV Competition funded by DGA



Objective	Stimulate University interest in MAV Research Field
Duration	3 ½ years (for Funded Universities)
Grants	French Schools of Eng. & Univer. will be funded (€40 K min.)
Co-operation	Co-operation between French and abroad Univ. will be apprec.
Competitors	No Limitation (International)
Competition	July 2005
Location	Dreux-Senonche - Former NATO Air Force Base (Tentative)
Judging Board	Mainly European and International
Prize Awards	To Be Defined (±€15 K from DGA) + Companies Contribution



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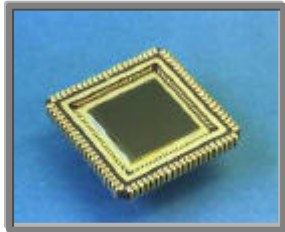
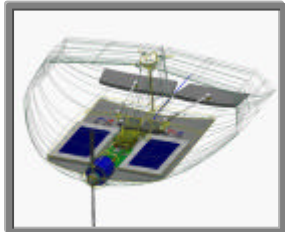
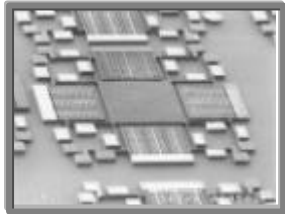
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Overview of Competition Schedule



About 20 French Teams will be funded (40 K€ minimum each)

French Teams Funded by DGA	Mil. 1	Assessment of French competitors	Feb. 2003
		Funds to Successful Teams	Mar. 2003
	Mil. 2	Asses. of new French competitors	June 2003
		Funds to Successful Teams	July 2003
		Work Progress Assessment & <i>In-flight Tests</i>	2003
	Mil. 3	Work Progress Assessment & In-flight Tests	July 2004

International Competition

July 2005

Foreign Competitors



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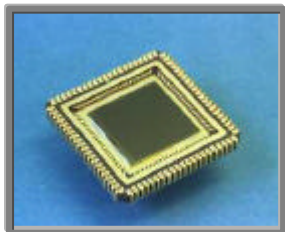
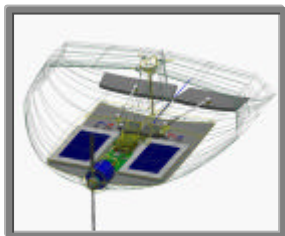
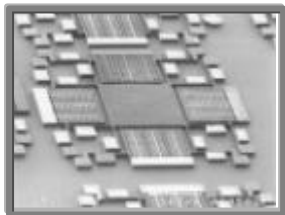
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Competition Missions



Missions will be a mix between:

Urban Canyon Flight

Platoon Escort

Fixed Target Designation



Stationary Flight Capability